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| Applicant: | Stanton M. Keeler | | |
| Assignee: | DPHI Acquisitions, Inc. | | |
| Title: | Error Correction Code Block Format | | |
| **Serial No.:** | **09/872,060** | Filing Date: | June 1, 2001 |
| **Examiner:** | **Joseph D. Torres** | Group Art Unit: | **2133** |
| Docket No.: | M-11585 US | Confirmation No.: | 2297 |

Irvine, California
December 20, 2004

**Via Facsimile to (703) 872-9306**

Mail Stop APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

## CERTIFICATION OF FACSIMILE TRANSMISSION

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1) **Transmittal Letter (1 page); and**

2) **Appellant's Opening Brief (9 pages).**

Dated: December 20, 2004

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Number of pages (including this sheet): 11

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Dear Sir:

Transmitted herewith are the following documents in the above-identified application:

(1) This Transmittal Letter (1 page); and
(2) Appellant's Opening Brief (9 pages).

☒ The fee has been calculated as shown below:

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☒ Conditional Petition for Extension of Time: If an extension of time is required for timely filing of the enclosed document(s) after all papers filed with this transmittal have been considered, an extension of time is hereby requested.

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Linda Bolter — December 20, 2004
Linda Bolter — Date

Respectfully submitted,

Jonathan W. Hallman
Attorney for Applicant
Reg. No. 42,622

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

First Named Inventor: Stanton Keeler
Application No. 09/872,060
Filing Date: 6/01/2001
For: Error Correction Code Block Format
Examiner: Joseph Torres
Art Unit: 2133
Attorney Docket No.: M-11585 US

# APPELLANT'S OPENING BRIEF

## Real Party In Interest

The real party in interest is DPHI Acquisitions, Inc., the present assignee of US Application No. 09/872,060.

## Related Appeals and Interferences

There are no other appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

## Status of Claims

Claims 16-20 are pending and are finally rejected.

Claims 1-15 and 21-28 are cancelled.

The rejection of claims 16-20 is appealed.

## Status of Amendments

An amendment is submitted with this appeal that cancels claims 25 through 28.

**Summary of Claimed Subject Matter**

The present invention relates to optical disks, and, more specifically, to first surface optical disks having error correction code blocks specialized for first surface optical disk operating environments.

As discussed by the Applicant on page 5, lines 7 through 14, conventional optical disks (such as the familiar CD-ROMS) are configured so that the information layer is covered by a relatively thick protective layer such as a polycarbonate layer, which is often denoted as a "substrate." Imperfections such as dust or fingerprints laying on the surface of the substrate are thus optically defocused with respect to the underlying information layer. In this fashion, users may routinely remove and insert CD-ROMs into their PC disk drive without wearing gloves or taking other precautions. Because the disk surface is optically removed from the information layer surface, these conventional optical disks may be denoted as "second surface" disks.

Applicant notes on page 5, lines 15-21 that second surface optical disks suffer from optical aberrations introduced as the laser beam passes through the relatively thick (typically greater than 50 wavelengths of the laser beam frequency) protective cover sheet. Such aberrations become prohibitive as the disk size and the corresponding optical path are miniaturized. Accordingly, the present assignee has developed "first surface" optical disks in which the information is read by a laser beam that does not pass through a relatively thick and defocusing protective layer. Through this first surface technology, optical disks having a diameter of 50 mm or less have been developed, which the present assignee advertises on the website www.dataplay.com.

Although these first surface optical disks may have a small form factor, thereby aiding portability and ease of use, Applicant noted certain problems in their implementation at page 5, line 28 through page 6, line 13. For example, the track length is necessarily smaller than in conventional optical disks. A conventional ECC block would thus "wrap around" the disk several times as seen in Figure 1. A dust particle would thus cause multiple burst errors in the same ECC block, thereby reducing the ability to cure the defect. Moreover, as shown

in Figure 2b, a dust particle will directly obscure (lie in the same focal plane as) the immediately-underlying information layer for a first surface disk. In contrast, the dust particle shown for the second surface disk of Figure 2a is defocused. Thus, a first-surface disk is prone to increased burst errors and greater sensitivity to defects.

To address these problems, Applicant has developed the ECC block shown in Figure 3. As set forth on page 7, lines 14-18, the ECC block is a two-dimensional array of codewords having 104 rows and 182 columns. Each row has 10 bytes of redundancy whereas each column has 16 bytes of redundancy. Thus, as compared to a conventional ECC block, the inventive ECC block set forth in Figure 3 is much more robust to burst errors and less sensitive to surface defects.

**Grounds of Rejection to Be Reviewed on Appeal**

1) Whether, under 35 U.S.C. § 103(a), claims 16 and 17 are unpatentable over U.S. Patent No. 6,332,206 to Nakatsuji, et al. in view of U.S. Patent No. 5,392,262 to Finkelstein, et al.

2) Whether, under 35 U.S.C. § 103(a), claims 18-20 are unpatentable over U.S. Patent No. 6,332,206 to Nakatsuji, et al., and U.S. Patent No. 5,392,262 to Finkelstein, et al., in view of ECMA-279 standard for DVD-Recordable Disks).

## Argument

Claim 16 is directed to a first surface optical disk that incorporates a robust ECC to address the aforementioned problems of first surface optical disks.

In contrast, Nakatsuji teaches its error correction apparatus only in the context of a conventional DVD-ROM. See, e.g., Col. 23, line 29. Accordingly, Nakatsuji provides no teaching or suggestion for the limitation in claim 16 of a disk having the limitation of "a transparent layer overlaying the information layer, wherein the thickness of the transparent layer with respect to the wavelength of the read/write laser beam is such that dust particles on the surface of the transparent layer are not defocused when reading data from the information layer with the laser beam passing through the transparent layer." As discussed previously, a second surface disk is relatively insensitive to dust errors because the protective coversheet defocuses the dust particles with respect to the underlying information layer.

In an effort to cure this deficiency in Nakatsuji, the rejection of claim 16 also used the Finkelstein reference. In that regard, it has been asserted that "Finkelstein teaches the use of thin transparent protective films 155 and 156 overlaying a magneto optical disk." However, consider Figure 2 of Finkelstein which plainly shows that its magneto optic disk is a second surface disk: for example, laser beam 47 passes through layer 155 and the substrate 150 to read MO layer 154. Because Finkelstein states in Col. 7, lines 66-67 that "the preferred axial thickness of substrate 150 is not less than one millimeter, for example, 1.2 millimeters," any dust particles or fingerprints on the surface of layer 155 are defocused with respect to the MO layer 154 being read by laser beam 47. Accordingly, Finkelstein also provides no teaching or suggestion for the first surface limitation of "a transparent layer overlaying the information layer, wherein the thickness of the transparent layer with respect to the wavelength of the read/write laser beam is such that dust particles on the surface of the transparent layer are not defocused when reading data from the information layer with the laser beam passing through the transparent layer." Instead, Finkelstein directly and positively teaches a defocusing effect. In that regard, the claim

limitation would have to be re-written as "a transparent layer overlaying the information layer, wherein the thickness of the transparent layer with respect to the wavelength of the read/write laser beam is such that dust particles on the surface of the transparent layer are ~~not~~ defocused when reading data from the information layer with the laser beam passing through the transparent layer" for Finkelstein to have relevance. But that is not what Applicant is claiming.

In that regard, Applicant stresses that the "first surface" limitation of claim 16 is not simply in the claim preamble as asserted in the 11/23/04 Office Action: the first surface limitation is expressly set forth in the claim 16 limitation of "a transparent layer overlaying the information layer, wherein the thickness of the transparent layer with respect to the wavelength of the read/write laser beam is such that dust particles on the surface of the transparent layer are not defocused when reading data from the information layer with the laser beam passing through the transparent layer." Applicant notes that MPEP 706.02(j) sets forth that one of the requirements for a prima facie case of obviousness is that "the prior art reference (or references when combined) must teach or suggest all the claim limitations." Because both Nakatsuji and Finkelstein only describe the use of conventional second-surface optical disks, the only teaching or suggestion for the limitation of "a transparent layer overlaying the information layer, wherein the thickness of the transparent layer with respect to the wavelength of the read/write laser beam is such that dust particles on the surface of the transparent layer are not defocused when reading data from the information layer with the laser beam passing through the transparent layer" comes from Applicant's disclosure. The Examiner has taken this first surface teaching provided by the Applicant and, with sheer hindsight, alleged that the modification of Nakatsuji to the specific ECC block limitation of "wherein the information layer is organized into ECC blocks, each ECC block forming an array of 104 rows and 182 columns of bytes, each row including ten bytes of inner parity and each column including sixteen bytes of outer parity" is obvious. Such hindsight reasoning is entirely improper under MPEP 2142, which notes that "impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior

art." Indeed, one of ordinary skill in the art at the time the present application was filed would be expressly motivated to not modify Nakatsuji in this fashion because the robust redundancy provided by the limitation of "wherein the information layer is organized into ECC blocks, each ECC block forming an array of 104 rows and 182 columns of bytes, each row including ten bytes of inner parity and each column including sixteen bytes of outer parity" necessarily reduces the disk data capacity. Applicant discovered that, although the disk capacity was so reduced, the benefits with respect to curing burst errors and reducing sensitivity to dust and other surface imperfections outweighed this disadvantage for the particular limitation of "wherein the information layer is organized into ECC blocks, each ECC block forming an array of 104 rows and 182 columns of bytes, each row including ten bytes of inner parity and each column including sixteen bytes of outer parity." Nakatsuji and Finkelstein are entirely silent with respect to providing motivation or suggestion for this limitation.

The ECMA-279 standard does nothing to cure the deficiencies of the Nakatsuji and Finkelstein references with regard to the limitations of "a transparent layer overlaying the information layer, wherein the thickness of the transparent layer with respect to the wavelength of the read/write laser beam is such that dust particles on the surface of the transparent layer are not defocused when reading data from the information layer with the laser beam passing through the transparent layer" and "wherein the information layer is organized into ECC blocks, each ECC block forming an array of 104 rows and 182 columns of bytes, each row including ten bytes of inner parity and each column including sixteen bytes of outer parity." Indeed, the ECM-279 standard describes an ECC block used in DVD-ROMS, a well-known and conventional second surface optical disk.

Accordingly, claim 16 and its dependent claims 17-20 are patentable over the combination of the Nakatsuji, Finkelstein, and the ECM-279 references.

Respectfully submitted,

Date: 12-20-04

By: Jon Hallman

Jonathan W. Hallman
Reg. No. 42,622

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Linda Bolter — December 20, 2004

Linda Bolter — Date

**Claims Appendix**

16. A first-surface optical disk for use with a laser beam, comprising:

an information layer, and

a transparent layer overlaying the information layer, wherein the thickness of the transparent layer with respect to the wavelength of the read/write laser beam is such that dust particles on the surface of the transparent layer are not defocused when reading data from the information layer with the laser beam passing through the transparent layer, and

wherein the information layer is organized into ECC blocks, each ECC block forming an array of 104 rows and 182 columns of bytes, each row including ten bytes of inner parity and each column including sixteen bytes of outer parity.

17. The first-surface optical disk of Claim 16, wherein said array includes row codewords being RS(182,172,11) and column codewords being RS(104,88,17).

18. The first-surface optical disk of Claim 16, wherein said array is divided into eight sectors, each sector having thirteen rows.

19. The first-surface optical disk of Claim 18, wherein each sector comprises eleven rows of data and two rows of outer parity, each row having ten bytes of inner parity.

20. The first-surface optical disk of Claim 18, wherein each sector comprises:

a four byte identification data (ID) field;

a two byte ID error detection code field;

a two byte system information field;

a 1880 byte user data field; and

a four byte error detection code field.